EDUCATIONAL ASSORTATIVE MATING AND CHILDBEARING WITHIN COHABITATION - EVIDENCE FROM FOUR EUROPEAN CONTEXTS

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Abstract

Childbearing within unmarried cohabitation has increased significantly over past decades. Earlier studies have linked non-marital childbearing to low educational attainment. In this study, we address non-marital childbearing from a couple's perspective, taking into account both his and her human capital. We examine the link between educational assortative mating and family formation within and outside marriage in Austria, Belgium, western Germany and eastern Germany. From a socio-economic point of view, we expect that higher education is associated with a lower likelihood of parenthood outside marriage. Furthermore, we expect that relationships where the man is more highly educated than the woman are more inclined towards traditional family behaviors. We apply competing risks models to the Generations and Gender Surveys for Austria and Belgium, and to the German Family Panel. For Germany, results show that non-marital childbearing is less likely among couples with a higher education. In western Germany, non-marital childbearing is more likely if the woman is more highly educated than the man. In Austria, we find that less educated couples are least likely to have their first child outside marriage, probably the result of the higher proportion of migrants who honor marriage over non-marriage in this group. In Belgium, we find no effect of educational pairing. Our results point to the peculiarity of each context and lead us to emphasize that results from one context should not be readily generalized. This study also shows that considering the male partner's educational background gives a more complete picture of the link between education and non-marital fertility.

Keywords

Assortative mating; Childbearing; Cohabitation; Education; Non-marital

Introduction

During the "golden age of marriage" and the baby boom years of the 1950s and 1960s, marriage was common and the mean age at marriage was highly correlated with the timing of the first child. Since then, Western societies have increasingly witnessed a decoupling of marriage and parenthood. The spread of non-marital childbearing is one of the most remarkable changes over time in family behavior: a growing number of people are having children before getting married or without getting married at all (Sobotka & Toulemon, 2008; Perelli-Harris et al., 2012; Klüsener, Perelli-Harris, & Gassen, 2013a).

Although changes in family behavior have not occurred everywhere to the same extent and speed (Klüsener et al., 2013a), general commonalities may be found across European countries. First, non-marital childbearing has not spread homogenously across population strata: differences among educational subgroups have been detected (Perelli-Harris et al., 2010). Secondly, the increase in non-marital childbearing across Europe has been largely attributed to the rise of childbearing within cohabiting unions (Kiernan, 2004; Perelli-Harris et al., 2010).

Investigating new forms of family formation is important because they have been shown to play a key role in the reproduction of social inequality and in affecting children's wellbeing in different social strata (McLanahan & Percheski, 2008). Policy-makers are seeking ways to adapt institutions to new family structures (Perelli-Harris & Sanchez-Gassen, 2012). Given the importance of human capital, it is important to know more about the link between educational level and non-marital childbearing to formulate appropriate policies that address the needs of the increasing group of non-marital families.

Existing studies of non-marital childbearing tend to focus on the mother's characteristics. Nevertheless, there are good reasons to consider the father's characteristics as well, primarily his human capital, acknowledging that most non-marital births occur within co-residential unions. The decision to have a child usually involves two people, and the balance or imbalance in bargaining power between the two partners may determine the decision-making process (see, Thomson, 1997; Corijn, Liefbroer, & de Jong Gierveld, 1996; Jansen & Liefbroer, 2006). Methodologically, the focus on the determinants of only one partner leads to a model misspecification and to an omitted variable bias (Gustafsson & Worku, 2006). The emphasis on the role of the male partner has also grown because the level of gender equity in the couple has been linked to fertility behavior (McDonald, 2000, 2013). As a result, it is reasonable to expect that the inclination of a couple for a non-marital birth is dependent not only on the woman's but also on the man's characteristics, notably their level of education and how they are linked.

Educational assortative mating is becoming a relevant concept, especially because of the reversal of the gender gap in education in recent decades: in recent cohorts, there are more highly educated women than

highly educated men entering the marriage market (Van Bavel, 2012). Although educational assortative mating is increasingly considered in studies as a potential determinant of demographic behaviors, for instance union dissolution (e.g., Schwartz & Han, 2014; Maenpaa & Jalovaara, 2014) and fertility (e.g., Gustafsson & Worku, 2006; Tsou, Liu, & Hammitt, 2011), empirical evidence on its effects on non-marital family formation is scarce. We aim to help fill this gap by examining the link between educational assortative mating and childbearing within cohabitation, comparing Germany with Austria and Belgium. We distinguish between eastern and western Germany because the two have been found to be very different (Klüsener et al., 2013a). We argue that it is useful to compare non-marital childbearing across four European regions, since its diffusion is strongly connected to the institutional and cultural context.

We use the retrospective fertility and partnership histories of couples and information on the highest educational attainment of both partners available in the Generation and Gender Survey for Austria and Belgium and Pairfam data for Germany. By means of a competing risk event history analysis, we ask how the educational assortative mating affects the hazard of non-marital childbearing.

Non-marital childbearing and educational assortative mating

Individuals with different educational backgrounds may differ in their choice to form a family within or outside marriage. The choice reflects their different attitudes, opportunities or constraints (Perelli-Harris et al., 2010). According to the Human Capital theory, a high level of education is a determinant of high income and high social status (Becker, 1964). Education also correlates with cultural beliefs, values and attitudes. Highly educated people have been found to initiate new cultural developments (Surkyn & Lesthaeghe, 2004).

The increasing diffusion of more liberal family behaviors in recent decades of the 20th century, such as divorce, cohabitation, the acceptance of abortion, as well as non-marital childbearing, has often been interpreted as an expression of an ideational change in values and attitudes toward the family on a societal level (Van de Kaa, 1987; Surkyn & Lesthaeghe, 2004). A more recent strand of literature, which focuses on the link between education and non-marital childbearing on the individual level, emphasizes the lack of socio-economic resources as a determinant in the choice of cohabitation over marriage, leading to a so-called "pattern of disadvantage" (Perelli-Harris & Gerber, 2011; Perelli-Harris et al., 2010). Marriage, it is argued, requires more resources because it may be associated with an expensive wedding ceremony. Furthermore, economic independence and good economic prospects are often seen as a prerequisite to getting married (Kravdal, 1999). As a consequence, non-marital childbearing is expected to be more prevalent among the least educated (Perelli-Harris & Gerber, 2011). The disadvantage refers not only to the lack of socio-economic resources, but also to the fact that cohabiting unions are more unstable and

have a lower relationship quality (Harknett, 2008). A lack of socially and economically suitable partners may induce less educated women to avoid marriage, but often to not renounce childbearing. As a consequence, children born to less educated women may face the dissolution of their parents' union more frequently and suffer higher poverty rates (McLanahan, 2004; McLanahan & Percheski, 2008). While the pattern of disadvantage's framework mainly focused on women's socio-economic conditions, Oppenheimer (2003) argued that men's poor and uncertain economic condition favors cohabitation as the preferred type of union because a low and unstable economic situation may undermine men's capabilities to make a strong commitment.

Empirical findings that focused on women's education often supported the idea of an education-linked disadvantage. For Austria and western Germany, Perelli-Harris et al. (2010) found that the negative gradient of women's education for the transition to the first birth was steeper for non-marital births compared to marital births, supporting the "pattern of disadvantage" framework. But educational differences with regard to cohabitation and non-marital fertility differ over time and context (Perelli-Harris & Sanchez-Gassen, 2012, Bhrolcháin & Beaujouan, 2013). This implies that there is no straightforward pattern for the diffusion of a new behavior through society.

Prior studies on fertility outcomes focused on the characteristics of only one partner, typically the woman, by assuming that people often mate with individuals that share the same values and lifestyles (Corijn et al., 1996). People who mate homogamously mostly have the same social background and have followed similar educational paths or are a member of the same religious community (Kalmijn, 1991; Blossfeld & Timm, 2003). A growing body of literature focuses on fertility from a couple's perspective, given that the decision to have a child is dyadic: it is affected by the socio-economic determinants of both partners, by the couple's values and attitudes with regard to the family and gender issues, and by the level of gender equity in the relationship with regard to the division of paid and unpaid labor (Thomson, 1997; Corijn et al., 1996; McDonald, 2000; Jansen & Liefbroer, 2006; Bauer & Kneip, 2013; Testa, Cavalli, & Rosina, 2014).

According to Becker's theory of partner's specialization, a negative assortative mating (dissimilarity of attributes between spouses) of socio-economic resources induces higher gains from marriage (Becker, 1991). A society based on the traditional male-breadwinner model would expect higher gains from marriage for couples in which the male partner is highly educated with high earning potential and does not spend resources in unpaid activities, while the female partner is less educated with lower earning potential and specializes in household activities. This mating pattern, however, does not hold as women increase their participation in higher education and labor market activities (Oppenheimer, 1994). A highly educated woman may become more attractive on the mating market since higher standards of living require that

both partners contribute to the household income, whereby homogamy due to educational attainment may become even more frequent (Oppenheimer, 1994). Furthermore, highly educated women may also partner more often a less educated man (Esteve, Garcia-Roman, & Permanyer, 2012; Van Bavel, 2012). Van Bavel (2012) argued that those less educated men who exhibit more gender egalitarian behaviors, for example by taking care of a larger share of household chores, may be attractive to highly educated women who want to have their own professional careers. This would represent the opposite situation of the one depicted in Becker's framework. A non-traditional mating pattern, like the one of the hypogamous couples, would be typical for non-traditional family forms, like cohabitation and non-marital childbearing.

Even if educational homogamy remains the most common pattern, it is interesting to know how heterogamous couples behave differently in family formation in general and non-marital childbearing in particular. Several studies have analyzed the transition to parenthood from a couple's perspective, including both partners' educational level, but none of these studies specifically addressed the difference in the risk of marital and non-marital birth (e.g., Corijn et al., 1996; Thomson, 1997; Gustafsson & Worku, 2006; Vignoli, Drefahl, & De Santis, 2012; Begall, 2013; Jalovaara & Miettinen, 2013). The type of union was usually treated as a covariate and, in line with expectations, the studies showed that married unions have a faster transition to first birth than cohabiting unions. Corijn et al. (1996), focusing on samples consisting of Flemish and Dutch people, separately analyzed directly-married couples from those who cohabited or remained unmarried. Results showed that among the couples who cohabited, the less educated had a higher rate of first births compared to the other educational pairings. Among directly married couples, the educational differences were much smaller and the woman's level of education was a stronger predictor for the time of first childbirth (Corijn et al., 1996). Still, from this study, it remains unclear whether a specific combination of partners' education favors or inhibits a non-marital birth compared to a marital one.

Research hypotheses about educational assortative mating

Based on the theoretical arguments and previous findings we have discussed so far, we draw two main hypotheses that consider the relationship between educational assortative mating and the hazard of the first non-marital childbearing.

Hypothesis 1 relies on the economic argument of the "pattern of disadvantage" framework. It states that a higher education is associated with a lower likelihood of parenthood outside marriage. This hypothesis implies that homogamously low educated couples have the highest risk of non-marital childbearing compared to the homogamously medium and highly educated couples. It also implies that two highly educated partners should have the lowest risk of non-marital childbearing. Hypothesis 2 looks at

heterogamous couples and takes the gender dimension into account. It derives from the argument that hypergamous couples are more inclined to traditional family behaviors, whereas the hypogamous couples are more prone to less conventional family behaviors. The hypothesis states that hypogamous couples exhibit a higher risk of non-marital childbearing than hypergamous couples.

Country background

The structure of partnerships and families is linked to the cultural and institutional setting in a country (Gauthier, 2007; Schnor, 2014a). Public policies can shape partnerships by defining the rights, responsibilities, opportunities, and constraints of the couple (Gauthier, 2007; Perelli-Harris & Sanchez-Gassen, 2012). The link between policies and behavior can vary according to context and across countries or regions, reflecting different cultural settings (Pfau-Effinger, 2005), and result in a wide range of marriage and childbearing patterns (Gauthier, 1996; Chesnais, 1998; Kaufmann et al., 2002; Liefbroer & Corijn, 1999). It is difficult, however, to separate the influence of social norms and policies on behavior: policies may mirror prevailing norms in the society and in turn reinforce social norms about marriage and family, reflecting the societal context (Klüsener et al., 2013a; Neels & de Wachter, 2010).

Policies on marriage and cohabitation

In Germany, non-marital cohabitation currently has no legal status. Marriage is guaranteed special protection under Article 6 of the Basic Law (Schnor, 2014a). It serves as a contract between the spouses in a number of different life domains, which include financial and insurance issues, as well as family relations and inheritance rules (Matthias-Beck, 2006, p. 104). The domains covered by a marriage contract are not regulated at an equivalent level in a non-marital union (Scherpe, 2005). In addition, there are several legal benefits associated with marriage that cohabiting couples do not enjoy. Married couples can, for example, take advantage of joint taxation, in which the incomes of the two spouses are added together, split equally, and then taxed jointly. This tax system especially benefits marriages in cases in which there are large income differences between the spouses (Perelli-Harris & Sánchez-Gassen, 2012). Married couples also have the right to co-insure the non-working partner in the health insurance plan of the spouse who works, and the partners are required to support each other financially. Cohabiting partners are only expected to do so in case of need. However, social security benefits are not paid to an unemployed person with a marital or a non-marital partner who has the means to support him or her. Since 1998, there has been no explicit distinction between marital and non-marital children. However, differences in the regulation of child custody have remained until recently. Before 1998, non-married fathers were not permitted to file for joint custody. While this changed with the reform, up until 2013, non-married fathers

could only obtain shared custody if the child's mother agreed. However, non-married mothers still have sole custody by default.

Before reunification, socialist East German family policy privileged non-married mothers through a special maternity leave program and supported dual earner families by a high provision of public childcare (Klüsener et al., 2013a; Konietzka & Kreyenfeld, 2002; Kreyenfeld, 2006). By contrast, West German policies offered financial and legal advantages to married couples. These were especially beneficial if the wife did not continue to work after family formation. The male-breadwinner model was also enhanced by a very low childcare provision (Konietzka & Kreyenfeld, 2002; Schnor, 2014b). The regional differences in childcare provision have remained after reunification, although family policy is increasingly addressing the needs of dual-earner families in recent years.

In Austria, policies distinguish between marriage and unmarried cohabitation in several domains, but fewer privileges are granted exclusively to marriage as compared to Germany. For example, tax advantages for married couples, such as a single-earner tax allowance, are partly also available to cohabitors under certain conditions (Perelli-Harris & Sanchez-Gassen, 2012). The right to co-insure a non-working partner in public insurance systems applies to married and cohabiting couples. Married partners are generally required to support each other financially. Cohabiting partners are required to provide for each other only if young children are present (Perelli-Harris & Sanchez-Gassen, 2012). But the social security law requires that co-residential partners, independent of the marital status, support each other in case of need. Long-term unemployed people do not receive basic social security payments if their partners have enough income to support them. Family policies in Austria have followed the traditional male-breadwinner model with a low availability of public and private childcare (Prskawetz et al., 2008).

In Belgium, different-sex couples can live in three different kinds of co-residential unions: in marriages, legal cohabitations and informal cohabitations. Marriages and legal cohabitations now have very similar rights (Delnoy, 2013). Only a few domains are reserved for marital couples, such as the automatic recognition of the male spouse as the legal father of the child and the reserve the surviving spouse has in case of the partner's death. Legal cohabitation was introduced in 2000 and quickly became commonplace among the population, primarily for two reasons. First, separation is far less complex than in the case of a marriage. Second, the tax system from 1962 to 2005 included a penalty for married couples: spousal income was combined to calculate the tax due, which could result in higher income taxes, given that the tax was progressive by income bracket, and in this way penalized working married women. In some cases, this even led to tax-related divorces (Delnoy, 2013; Waaldijk, 2005). Since 2005, marriages and legal cohabitations are taxed in the same way, by a marital quotient, in which the income is first aggregated and then split (Delnoy, 2013; Haulotte et al., 2014). Informal cohabitors are taxed individually. Regarding

parenthood, there are no differences imposed by the parents' marital status. Since 1987, all children have the same legal status and the mother's consent is no longer needed to establish paternity. Social policies have provided practical support for families since the 1970s through a high availability of childcare that allowed couples to combine work and family (Esping-Andersen, 1999; Neels & de Wachter, 2010).

Fertility and non-marital childbearing

Beyond the German language, Austria and Germany also share a low level of fertility, which is largely attributable to the high level of childlessness, especially among highly educated women (Sobotka, 2012). In 2012, the Total Fertility Rate (TFR) was 1.38 in Germany and 1.44 in Austria (Eurostat, 2014). Important differences exist within Germany itself. In particular, the level of childlessness has been higher in the western German region compared to the eastern. Belgium, on the other hand, has a higher fertility rate than the German-speaking countries (with a TFR close to 1.8, see Eurostat, 2014), which may be explained by its more work- and family-friendly policy (Esping-Andersen, 1999, 2009; Klüsener et al., 2013b).

Non-marital childbearing is quite common in Belgium, although it has not been in the past. Belgium shares the experience of a steep increase in the shares of non-marital births with eastern Germany. Considering the development in the proportion of non-marital births relative to all births from 1970 to 2012 in comparative perspective, Figure 3.1 shows that childbearing outside marriage has become more common in all the regions in question, while a substantial cross-regional variation has remained. In the 1970s, non-marital childbearing was very rare, especially in western Germany and Belgium. In the latter regions, conservative cultural attitudes together with pro-marriage policies discouraged non-marital childbearing (Goldhaber, 2007; Klüsener et al., 2013a). Less than 5 percent of the western German and Belgian children were born to unmarried parents, in comparison to 16 percent in eastern Germany and 14 percent in Austria. In the following decade, non-marital childbearing increased, especially in eastern Germany, due to the socialist family policy (Dorbritz, 2008). This upward trend has persisted until today, although the institutional setting of eastern Germany has changed. In contrast, Austria has followed - on a higher level - the trend in western Germany with a modest increase in non-marital births, influenced by conservative family policies of the respective governments that support marital family formation (Sprangers & Carssen, 2003). Since the 1980s, Belgium has experienced a sharp increase in non-marital births. Within a few decades, the country has overtaken the proportions of non-marital childbearing in western Germany and Austria and has approached the high levels of eastern Germany. In 2012, half of the Belgian children and more than half of the eastern German children were born to non-married parents. In that same year, the majority of the children in Austria and western Germany were born to married parents.

The two parts of Germany are now at the extremes in Figure 3.1, while Belgium and Austria are in the middle.

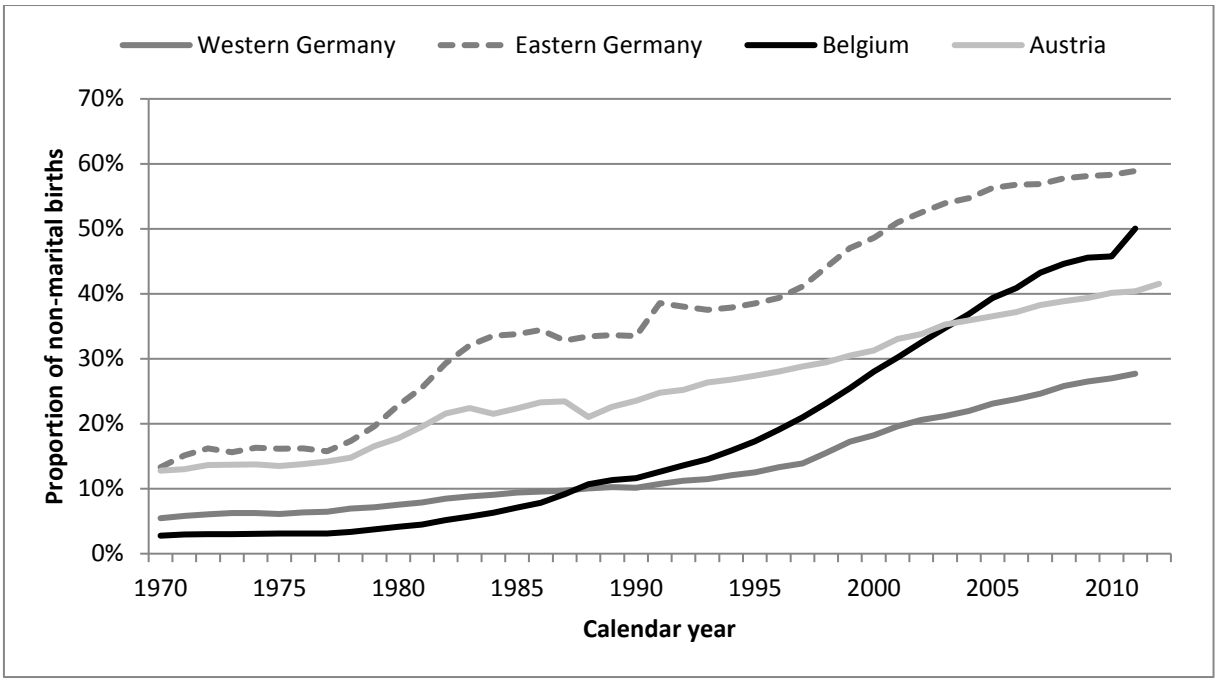

Fig. 3.1 Non-marital childbearing (live births to non-married mothers relative to all live births), 1970-2012. Source: Eurostat (2014); Institute for Population Research (BIB) (2014)

Research hypothesis about macro-level differences

Given the heterogeneity in family behavior and institutional settings, hypothesis 3 states that we should find different patterns in different contexts. The impact of education is likely to be weaker in societies that treat marriage and cohabitation in similar ways and in which childbearing within cohabitation has become widely accepted. It should be stronger in societies in which marriage is strongly emphasized and favored over cohabitation. We expect the effect of educational pairing to be strongest in western Germany, where non-marital childbearing is increasing at a slower rate and policies still favor marriage over cohabitation. We expect the effect of educational pairing between marital childbearing and non-marital childbearing to be weaker in contexts that have experienced high levels of non-marital childbearing, such as Austria and eastern Germany. The effect of educational pairing in Belgium is expected to be the least pronounced due to policies that treat cohabitation and marriage equally in many domains.

Data

We used Generation and Gender Surveys (GGS) data for Austria and Belgium, and the German Family Panel data (pairfam/DemoDiff; *pairfam* Release 3.1) for Germany. The Austrian GGS has been carried out during from 2008 to 2009, whereas the Belgian one was carried out from 2008 to 2010. The GGS were conceptualized to improve the knowledge of macro and micro factors that affect the relationships between generations and between genders (http://www.ggp-i.org/). The surveys include individuals between 18 and 79 years old and include information on the fertility and partnership histories, the transition to adulthood, economic activities, care duties and attitudes (see Vikat et al., 2007). Similar information has been gathered in the German Family Panel (pairfam) among respondents born within the cohorts 1971-1973, 1981-1983 and 1991-1993. Pairfam is a nationwide random survey with yearly interviews starting from 2008/2009 (respectively from 2009/2010 for the eastern German oversample DemoDiff) (pairfam: Huinink et al., 2011; Nauck et al., 2012; DemoDiff: Kreyenfeld et al., 2011, 2012, 2013a, 2013b).[1] The German Family Panel has a multi-actor design. As such, the respondents' partners were also interviewed. During the first interview, retrospective partnership histories were collected on a monthly basis. The partnership information was updated with each subsequent wave. We made use of a ready-to-use event history data set that incorporates all relevant partnership and fertility information of the first three waves (Schnor & Bastin, 2014). We considered the fertility information of male and female respondents (and their partners) from the birth cohorts 1971-1973 and 1981-1983. To enhance comparability between the GGS and the German Family Panel data, we selected respondents in the Austrian and Belgian sample born between 1970 and 1983. As a result, at time of the interview, the respondents in Austria were 25 - 39 years old, whereas their partners were between the ages of 19 and 69. In Belgium, at time of the interview, the respondents were aged 25 - 40 and their partners were between the ages of 20 and 57. Respondents of the German Family Panel were up to 40 years old at the time of their latest interview, while their partners were between the ages of 17 and 68 in the western German sample and between the ages of 17 and 57 in the eastern German sample.

To proceed with our analysis of the couples, we had to select individuals who were in a co-residential union at the time of the first interview in order to have information about the partners' characteristics (see description of sample selection in the Appendix, Table 3.3). We focused on the transition to the first child, which means that we excluded unions in which one of the partners had children from previous partnerships. We limited our analysis to couples where the female partner was between the ages of 15 and 45 (still in her reproductive ages) at time of union formation, and to couples where the woman's age was

[1] The German Family Panel is coordinated by Josef Brüderl, Johannes Huinink, Bernhard Nauck and Sabine Walper. It is funded as a long-term project by the German Research Foundation (DFG).

known. We deleted cases if information about the date of union formation (= start of the couple's co-residence) or the date of first childbirth were missing. We focused on partners who were already co-residing at the time of first childbirth because we only had information for Belgium and Austria on the partnership duration since the couple moved in together. This restriction limited the number of cases, especially among German couples with non-marital childbearing, as shown in Table 3.3 and Table 3.4 (see Appendix). The main independent variable is the combination of the partners' levels of educational attainment. We distinguished between seven categories of educational pairings: three categories for couples where men and women have the same educational attainment, i.e. homogamous couples ("both low[2]" (1); "both medium[3]" (2), "both high[4]" (3)); two categories for hypergamy (couples in which the man is highly educated and the woman medium or low educated (4) and couples in which men are medium educated and women have a low level of education (5); and two categories for hypogamy (couples in which the woman is highly educated and the man medium or low educated (6) and couples in which women are medium educated and men low educated (7)). A separate category is assigned in case of missing educational information for one of the partners. In Table 3.1, we show the educational composition of the couples under study. In Austria as well as in eastern Germany, the majority of the couples consisted of a medium educated man and a medium educated woman (53% in Austria, 41% in eastern Germany). In western Germany, medium educated as well as highly educated, homogamous couples each represented 26% of all couples. Among Belgian couples, only 16% were homogamously medium educated; these couples ranked third after homogamously highly educated couples (representing 40%) and couples with a highly educated woman and a medium or low educated man (19%). In Belgium and in eastern Germany, couples in which the woman was more highly educated than the man were more common than couples in which the man was more highly educated than the woman. The opposite was true in Austria and western Germany. Couples with a lower and a medium educated person or with two people with lower education levels were not that common in the four contexts studied; altogether, they amounted to approximately 15%.

We also included the age difference between partners in our models, coded in four categories: both partners have the same age or 1 year difference (1); the woman is older than the man by more than 1 year (2); the man is older than the woman by 2 to 4 years (3); the man is older than the woman by more than 4 years (4). We included the age of the woman at union formation in years (linear and squared), the sex of the respondent, the union's cohort, and the respondent union's order as control variables (see Table 3.1).

[2] ISCED 0, 1, 2
[3] ISCED 3, 4
[4] ISCED 5, 6

Table 3.1 Descriptive statistics

	Austria	Belgium	Western Germany	Eastern Germany
Respondent's sex (%)				
Male	36.6	44.3	42.5	44.4
Female	63.4	55.7	57.5	55.6
Union's cohort (%)				
1986-1994	18.7	10.6	16.6	17.5
1995-1999	28.4	30.1	23.0	21.0
2000-2004	33.9	37.4	32.8	31.9
2005-2010	19.1	21.7	27.6	29.6
Educational Assortative Mating (%)				
Man low & Woman low	3.2	6.1	4.6	1.0
Man low & Woman medium	3.0	5.7	4.8	2.8
Man medium & Woman low	7.6	4.2	7.1	4.2
Man medium & Woman medium	52.7	16.0	26.0	41.0
Man medium-low & Woman high	8.5	19.4	13.5	17.2
Man high & Woman medium-low	13.5	6.5	16.8	10.8
Man high & Woman high	11.6	40.3	26.3	22.3
Missing information	0	1.6	1.0	0.6
Union's order respondent (%)				
First union	83.5	60.5	86.1	85.6
Higher order	16.6	39.5	13.9	14.4
Age difference (%)				
Age homogamy (< 2 years)	22.3	26.8	36.6	38.1
Woman older	12.1	13.5	7.8	8.0
Man 2-4 years older	36.9	35.0	31.9	31.1
Man 5 or more years older	28.7	24.0	22.9	21.7
N/A		0.7	0.8	1.2
Woman's age union formation (mean)	22.8	24.0	23.5	22.9
Union duration until interview date (mean)	107.8	99.9	48.7	49.3
Number of events				
No child	415	249	1,108	423
Non-marital birth	379	269	492	596
Marital birth	584	496	1,886	421
N	1378	1014	3486	1440

Method

Our event of primary interest was a non-marital first childbirth. In order to describe the transition to non-marital family formation for a couple, in place of the Kaplan-Meier estimator, we estimated the cumulative incidence function for each context. This approach accounts for the fact that couples can either have their first child within or outside of marriage. If we treated the competing event of having a marital first childbirth as censored, we would obtain biased estimates for the rate of non-marital childbearing (Fine & Gray, 1999; StataCorp, 2013). At any time *t*, the couples had experienced a first child outside marriage with hazard $h_1(t)$, had experienced a first childbirth within marriage with hazard $h_2(t)$ or were still under the risk of both events. The cumulative incidence function is a nonlinear function of $h_1(t)$ and $h_2(t)$ (see Fine & Gray, 1999, for the formal model with detailed discussion).

Next, we estimated four models separately for each context following the approach used by Perelli-Harris et al. (2010) and Perelli-Harris and Gerber (2011). We applied a discrete time-competing risk model, namely a multinomial logistic regression (Agresti, 2002) with three outcomes: no first child, non-marital first child, or marital first child. This kind of modeling strategy assumes that the odds of having a non-marital birth do not depend on the alternative outcomes (i.e. independence of irrelevant alternatives assumption). The data were censored at the time of the latest interview or by 15 years since union formation, whichever comes first. A formal description of the model is:

$$h_{it}(m) = \frac{\exp(\sum_j x_{ijt}\beta_{jm})}{\sum_{k=1}^{M}\exp(\sum_j x_{ijt}\beta_{jk})}$$

where $h_{it}(m)$ is the risk for individual *i* of experiencing event *m* in month *t* since union formation; x_{ijt} represents the value for each *j* independent covariates in month *t* for individual *i* and β_{jm}, which are the respective coefficient parameters estimated by means of the maximum likelihood method. The process in time for all our models is time since co-residential union formation. For the German data only, we also estimated models that accounted for the time since partnership formation, as a robustness check, but the results did not change substantially.[5] In order to account for non-linearites in the shape of the hazard to the first shared child, we controlled for the duration variable *t* and its square.

[5] We could only check with German data because Generation and Gender Surveys do not provide information about the beginning of the relationship for individuals who are living together. The effect of educational assortative mating did not change in the sign and significance of the estimated coefficients.

Results

Descriptive findings: cumulative incidence functions

In Figure 3.2, we describe the transition to a first child within marriage or cohabitation by means of country-specific cumulative incidence functions. The curves show the proportions of couples experiencing a first childbirth, distinguishing between a first marital and non-marital birth. In all regional contexts, most of the couples (90% and higher) experienced parenthood within the first fifteen years of co-residence. Regional differences prevailed in the propensity for marital vs. non-marital childbearing and were most pronounced in western and eastern Germany. In western Germany, most of the first children were born to married parents, whereas in eastern Germany, the majority of the first children were born to cohabiting parents. The pace of first childbearing was similar in eastern and western Germany. In comparison to western Germans, Belgian and Austrian couples more often formed a family within cohabitation, although the majority of the couples still had a first childbirth within marriage. In Austria, the proportion of couples who became parents within marriage was consistently increasing with union duration. This was less the case in Belgium. Here, the transition to a first marital child occurred especially between three and eight years of co-residence, while few changes in the family status occurred thereafter.

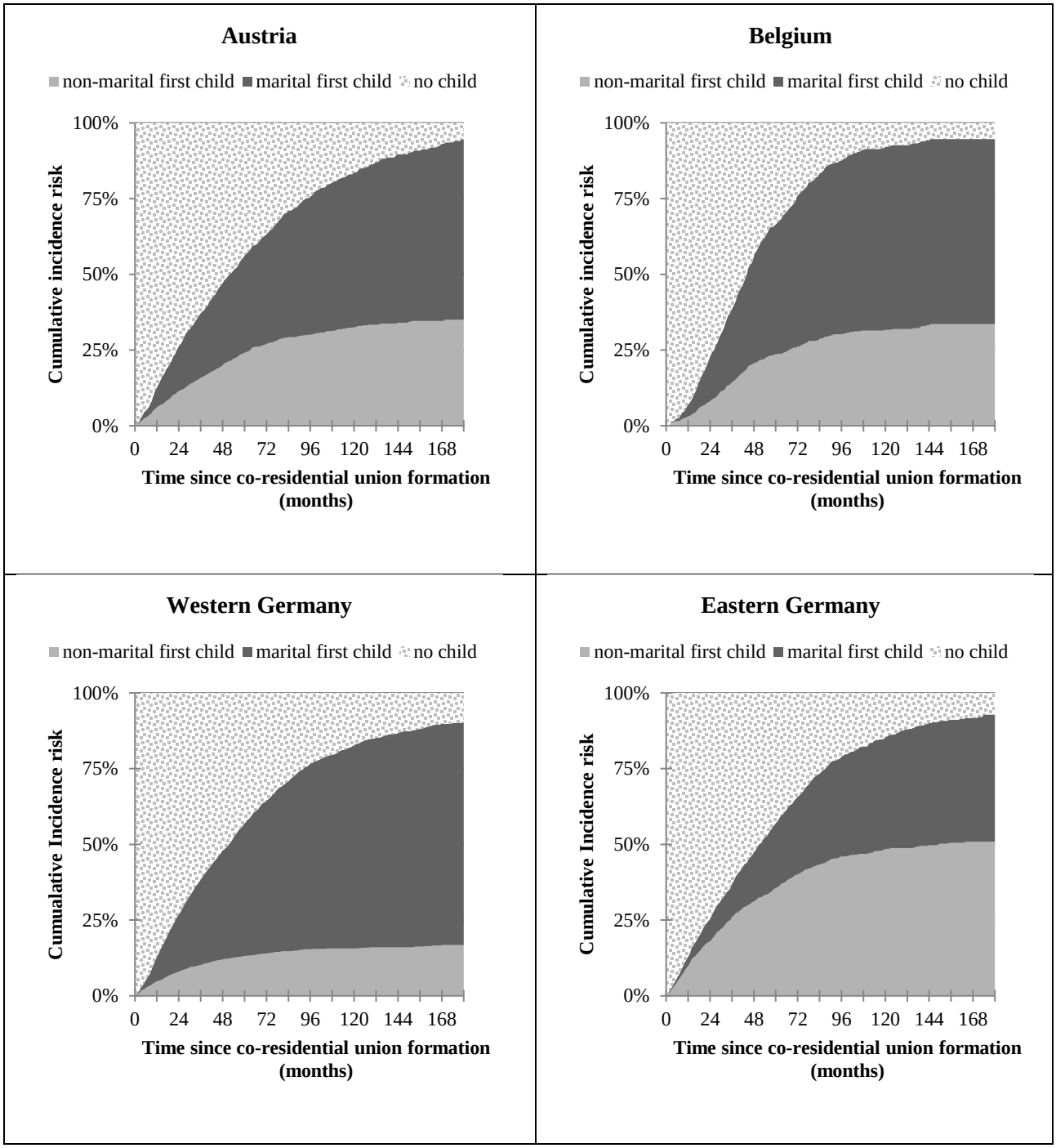

Fig. 3.2 Cumulative incidence functions of having a marital or non-marital first child

Multivariate analyses

We estimated multinomial logistic regression models and used a marital first childbirth as the reference outcome. Table 3.2 shows the relative risks ratios of having a non-marital first childbirth compared to a marital first birth. Table 3.5 of the Appendix shows, instead, the relative risk ratios of not having a first child compared to a marital birth. In this section, firstly, we discuss the effect of the educational assortative mating, which is our main explanatory variable, based on the results of Table 3.2. We used the homogamously medium educated couples as the reference category. Secondly, in order to enhance the models' interpretation, we display the predicted probabilities of having a first non-marital or marital birth by the educational pairing for each of the four contexts in Figure 3.3. The predicted probabilities were calculated by fixing the values of the other independent variables included in the model. We calculated probabilities for female respondents in a co-residential first union for two years, who formed a union between the years 2000 and 2004 at the age of 24 years, and whose partners had the same age or a maximum difference of one year. Finally, we discuss the effect of the control variables that were included in the models.

Non-marital versus marital family formation

From Table 3.2, we notice that the risks of non-marital childbearing were lower in eastern Germany than the risks of marital childbearing, if at least one of the partners was highly educated. Eastern Germans homogamously highly educated couples had a 65% lower risk of a non-marital birth compared to the reference group. Both hypergamous and hypogamous couples with one highly educated partner had also a lower risk of non-marital birth, 71% and 50% respectively. In western Germany, non-marital family formation pattern of homogamously medium educated couples appeared to be similar to the other educational pairings. We found only hypergamous couples, in which the man was highly educated and the woman medium or low educated, to be different from other couples: they had a 40% lower risk of a non-marital birth. The patterns were different in Austria and Belgium. In Austria, homogamously low educated couples had a 75% lower risk of having a first childbirth within cohabitation. Hypogamous couples in which the woman had a medium education level and the man had a low level of education also had a 60% lower risk of a non-marital birth. Furthermore, couples with a highly educated man and a woman with a medium or low level of education experienced lower risks of non-marital childbearing. The non-marital childbearing patterns of homogamously highly educated couples and couples in which the man had a medium level of education were not significantly different from homogamously medium educated couples. In Belgium, it seems that the educational pairing did not play a role in the propensity for a particular type of union at first birth.

Probability of family formation and educational assortative mating

Figure 3.3 reveals that homogamously low educated couples had a higher probability of a first birth, in general, compared to the homogamously medium and highly educated. The presence of a highly educated woman in particular tended to decrease the likelihood of a first child. We also see from the predicted probabilities that a non-marital childbirth was more likely to occur among the less educated in eastern Germany, while a marital birth was more likely to occur among the less educated in Austria. In Austria and eastern Germany, the differences between the probabilities of a marital or non-marital childbirth decreased as the level of education of each partner increased. In line with our first hypothesis, the probability of a marital childbirth in eastern Germany increased as the levels of education of both partners increased, while the probability of a non-marital childbirth decreased as both partners' educational levels increased. In western Germany, Figure 3.3 shows that the probability of a marital birth was higher across educational pairings than a non-marital birth. This difference slightly decreased with an increased educational level of each partner, but we did not observe a convergence of the probabilities with increasing education as we observed for Austria and eastern Germany. In Belgium, homogamously low educated couples and couples with a low educated partner tended to have higher probabilities of having a first child. But there was no clear pattern with regard to differentials in the union type at first childbirth among educational pairings.

The effect of other couple-related variables on non-marital family formation

In each context, unions formed before the year 2000 had a lower risk of a non-marital birth than unions formed thereafter. With the exception of Austria, the risk of a non-marital birth was found to depend strongly on union duration. Non-marital births were concentrated in the early stages of the co-residential union. In Belgium and western Germany, the woman's age at union formation was negatively related to the risk of a non-marital birth compared to marital. Cohabitations may be most common among the youngest and be turned into marriages as the woman's age increased. Couples in which the respondent already had prior partnership experience had higher risks of a non-marital birth compared to first partnerships in all regions (with the exception of eastern Germany, where the effect was not significant).With regard to the age difference between partners, we found that in Belgium and western Germany, there was a lower risk of a non-marital birth for couples in which the man was older than the woman compared to couples in which partners had the same age or there was just one year's difference. In Austria, couples in which the woman was older than the man had a higher risk of a non-marital birth compared to the age-homogamous couples. These findings could relate to our second hypothesis: traditional mating patterns (i.e. the man is older than the woman) show a lower risk of non-marital childbearing, whereas non-traditional mating patterns (i.e. the woman is older than the man) have a higher propensity towards non-marital childbearing relative to age-homogamous couples.

Table 3.2 Relative risk ratios of a non-marital first childbirth compared to a marital first childbirth

VARIABLES	Austria	Belgium	Western Germany	Eastern Germany
Time since union formation	0.99	0.98**	0.96***	0.97***
	(0.01)	(0.01)	(0.00)	(0.01)
Time since union formation^2	1.00	1.00***	1.00***	1.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Woman's age at union	0.81*	0.54***	0.76***	0.85
	(0.099)	(0.10)	(0.06)	(0.14)
Woman's age at union^2	1.00	1.01***	1.01***	1.00
	(0.00)	(0.00)	(0.00)	(0.00)
Male (ref. Female)	0.80	0.74*	0.97	1.02
	(0.12)	(0.12)	(0.11)	(0.14)
Union's cohort (ref. 2000-2004)				
1986-1994	0.58**	0.22***	0.54***	0.40***
	(0.13)	(0.07)	(0.09)	(0.08)
1995-1999	0.66**	0.41***	0.75**	0.70*
	(0.12)	(0.08)	(0.11)	(0.13)
2005-2010	1.02	2.02**	1.79***	1.25
	(0.28)	(0.56)	(0.26)	(0.27)
Educational Assortative Mating (ref. Man medium & Woman medium)				
Man low & Woman low	0.25***	0.60	0.81	3.17
	(0.10)	(0.23)	(0.19)	(3.35)
Man low & Woman medium	0.40**	1.77	0.68	0.69
	(0.17)	(0.61)	(0.17)	(0.31)
Man medium & Woman low	0.83	0.98	0.83	0.66
	(0.20)	(0.38)	(0.17)	(0.25)
Man medium/low & Woman high	0.88	0.90	1.14	0.50***
	(0.26)	(0.24)	(0.19)	(0.10)
Man high & Woman medium/low	0.70*	1.22	0.60***	0.29***
	(0.15)	(0.43)	(0.10)	(0.07)
Man high & Woman high	0.76	0.71	0.80	0.35***
	(0.19)	(0.16)	(0.12)	(0.06)
Missing		0.20	2.21*	0.31
		(0.21)	(1.02)	(0.31)
Union's order (ref. first union)				
Higher order union	2.16***	2.14***	1.98***	1.06
	(0.47)	(0.36)	(0.31)	(0.23)
Age difference (ref. homogamy or age difference < 2 years)				
Woman 2 or more years older	1.72**	0.79	1.24	0.96
	(0.46)	(0.23)	(0.29)	(0.28)
Man 2-4 years older	0.83	0.74	0.77**	0.98
	(0.15)	(0.15)	(0.10)	(0.15)
Man 5 or more years older	0.72*	0.51***	0.87	0.88
	(0.14)	(0.12)	(0.12)	(0.16)
Missing		0.40	0.32	6.62*
		(0.49)	(0.34)	(7.27)
log (Constant)	3.50**	8.21***	3.39***	4.30**
	(1.63)	(2.52)	(1.12)	(1.96)
Likelihood ratio test (LR chi^2)[a]	135.71***	50.35***	157.00***	89.89***

Notes:
Robust standard errors in parentheses; Significance levels: *** p<0.01, ** p<0.05, * p<0.1
[a] The likelihood ratio test indicates the increase in model fit after including educational pairing.

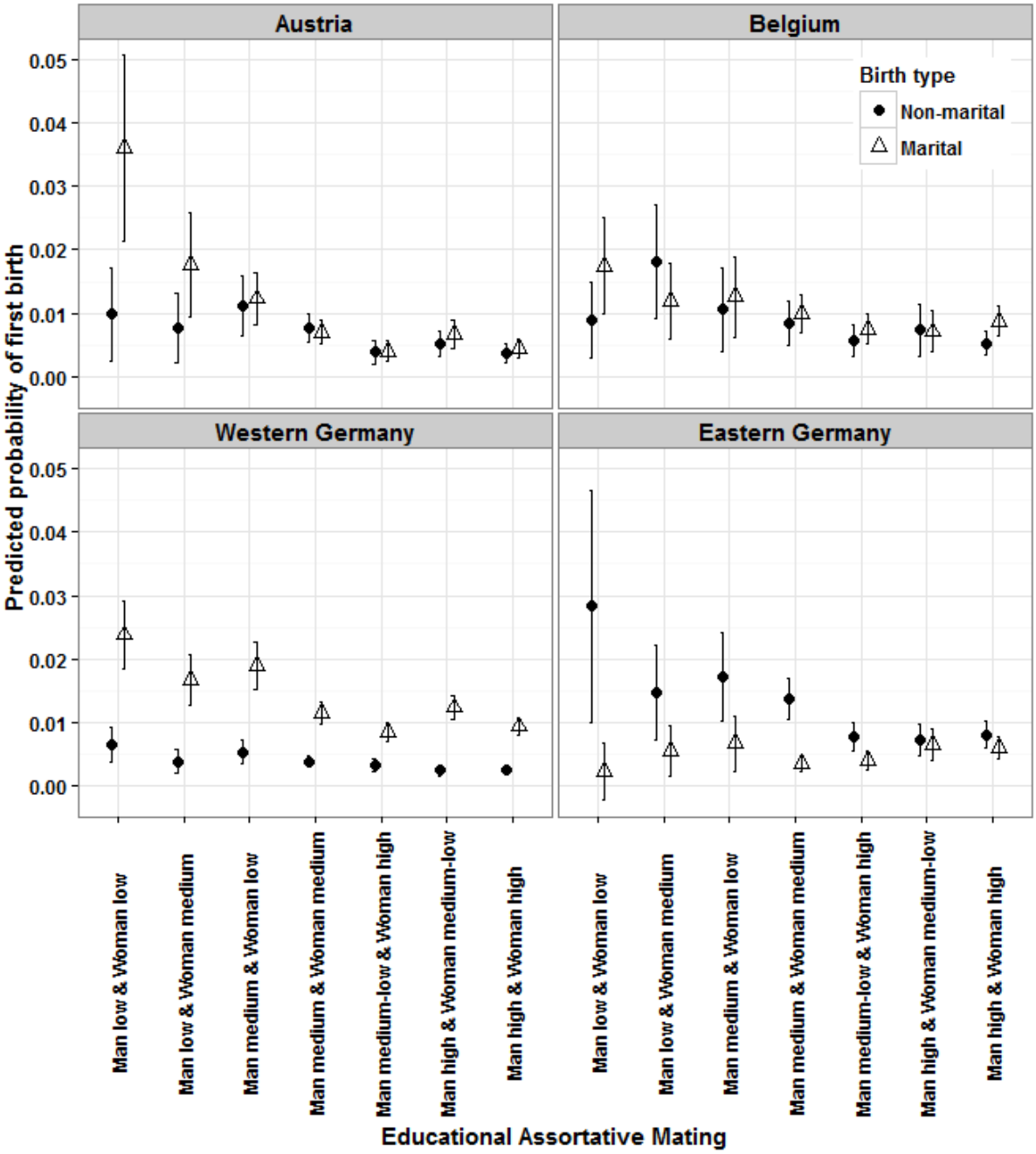

Fig. 3.3 Model-based predicted probabilities of having a marital or non-marital first childbirth by the educational assortative mating groups[6]

[6] The lower limit of the 95% confidence interval of the predicted probabilities for the homogamously low educated couples in eastern Germany is negative. This may occur when the delta method is used to calculate confidence intervals (Xu & Long 2005).

Conclusions and discussion

In this chapter, we explored how educational assortative mating affects the risk of non-marital family formation in four European contexts, by means of discrete time-competing risk event history models. In eastern Germany, the results systematically point to a pattern driven by advantage and disadvantage (with disadvantage being associated with non-marital childbearing), supporting the socio-economic argument underlying hypothesis 1: more highly educated couples had a lower risk of a non-marital childbirth than couples with less human capital. The results for western Germany are in line with hypothesis 2, pointing to a pattern driven by traditional gender roles (with more marital childbearing in couples where the man has a higher education than the woman).

Comparing eastern and western Germany is instructive because the legal context is the same, whereas the cultural and economic circumstances are different. In western Germany, having a child within marriage can be important for normative reasons because forming a non-marital family may violate social norms. Economic considerations may reinforce the normative pattern and contribute to the higher likelihood of childbearing within marriage among couples where the man has a higher education than the woman. German legal regulations provide financial advantages exclusive to marriages, which are especially beneficial if one partner is the primary earner. The primary earner is typically the man, particularly in hypergamous couples and particularly in western Germany. Eastern Germany does not have such a strong tradition of male-breadwinner families and wages tend to be lower compared to the western part of the country. As a result, the economic contributions of both partners weigh more equally and more heavily in the couple's decision-making process.

In Austria, results were not in line with our hypotheses. Couples with a low educated man and a low or medium educated woman had lower risk of a non-marital childbirth than other educational pairings. To better understand the reasons of our findings, we checked the characteristics of the homogamously low educated couples. We found that more than half of the respondents in these couples were not born in Austria. Once we included information on whether the respondent was born in the country (the results are available upon request), homogamously low educated couples were not statistically different from the medium educated; a finding in line with Berghammer et al. (2014). According to the authors, disapproval of non-marital childbearing in Austria is higher among the less educated, migrants, and religious individuals (Berghammer et al., 2014). In equivalent models for the other contexts, the inclusion of the additional information did not change the results. Controlling for the country of origin, Austrian results tend to support hypothesis 2, similar to western Germany. A reason for this is that Austria had, like eastern Germany, an established tradition of non-marital family formation combined with subsequent marriage (Kiernan, 2004), whereas this was not the case for western Germany and Belgium (also see Figure 3.1).

However, in Austria, like in western Germany, traditional gender division of labor is more common than in Belgium and eastern Germany (Konietzka & Kreyenfeld, 2002; Prkawetz et al. 2008; Neels & de Wachter, 2010).

In Belgium, we found the difference between marital and non-marital childbearing patterns to be similar across educational pairings. One reason for this finding can be the inconsistency in the taxing policies, which changed in 2005 from a penalty for married couples to tax benefits for both married and legally cohabiting couples. These policies might have promoted the diffusion of non-marital family formation among all social groups. With the recent equalization of marriages and legal cohabitations, the link between marital family formation and education might have become even more disconnected. Unfortunately, the small sample size did not allow us to test interactions between the educational assortative mating and the year of union formation. Another reason can be that our finding is the result of a relatively low level of stratification of students in the Belgian school system. The high level of diffusion of university education in the population might have decreased its impact on private life decisions on the micro level.

Overall, the results supported our contextual expectations as stated in hypothesis 3. Educational differences were much stronger in western Germany, where policies have stimulated marriage over cohabitation and where socio-cultural norms delayed the diffusion of new family forms. In eastern Germany and Austria, educational differences also played a role in the propensity of non-marital birth to a lesser extent, while in Belgium there was no significant effect of the educational assortative mating. From this research design, however, it is difficult to separate the role of policies and cultural norms, also given that policies are often a by-product of cultural norms and vice versa (see section on country background).

Some limitations of this study need to be mentioned. In order to keep a couple's perspective, we had to select individuals who were in a union at the time of the interview. So our samples tend to represent more stable couples. As a consequence, our results hold better for more stable unions, which are also those in which it is more likely that childbearing occurs. A further limitation is that we could not account for possible couples' changes in the educational attainment between the time of union formation and the first birth, which might have inflated our results (Hoem & Kreyenfeld, 2006). In the future, it would be interesting to approach the study of couples' family behavior from a prospective point of view in order to avoid selectivity and reverse causality issues related to the lack of retrospective information. In this study, we decided not to use prospective information to enhance the comparability between surveys.

We decided to concentrate on the union context at the time of first childbirth because it becomes important for normative, legal and financial reasons. Still, the marital status at one point in time is somewhat

arbitrary and does not reveal that childbearing and marriage are often an issue of timing. In future research, the approach may be extended to a multistate event history model in order to also analyze the transition from cohabitation to marriage.

In summary, our study has shown that considering the male partner's educational background gives a more complete picture of the link between education and non-marital fertility. Policy-makers should consider that family policies affect the distribution of non-marital childbearing among educational pairings. We have shown that each partner's educational level may contribute differently in the risk of non-marital childbearing, depending on the context. The heterogeneity in our results demonstrated that the comparative approach is necessary and useful. It points to the particularity of each context and leads us to emphasize that empirical studies' results should not be readily generalized. It is plausible that the differences in family behavior between educational pairings are embedded in the meaning of educational differentials between partners in each context. The fact that hypergamous couples tend to have a lower risk of non-marital childbearing compared to the hypogamous ones may depend on the prevalence of traditional gender roles on a macro level. As a result, educational differentials between the female and male partner may translate into stronger differentials in bargaining power in contexts with less gender equality (Lundberg & Pollak, 1996; Testa et al., 2014). Depending on gender differences in the preference for marriage over unmarried cohabitation, this will have implications for the rate of non-marital childbearing. Future studies about the role of educational assortative mating on the risk of non-marital birth might extend the range of countries and cohorts in order to test contextual effects by means of multilevel modeling. Our study represents a foothold for future research about non-marital family formation, aiming to discover mechanisms relative to non-marital childbearing that are linked to the combination of partners' characteristics.

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Appendix

Descriptive statistics

Table 3.3 Selection of the samples

	Austria	Belgium	Western Germany	Eastern Germany
Initial sample size	5,000	7,163	10,032	3,822
Not in a union at time of interview	1,924	2,281	5,926	1,982
Same-sex couples	7	60	38	20
Not born 1970-1983	1,346	3,582	108	39
Previous children	248	189	210	156
Date union missing	6	4	40	19
Date birth missing	0	6	17	6
Childbirth preceding union formation	84	20	204	135
Woman's age missing or not in interval 15-45	7	5	18	8
Man's age union formation < 15	0	2	1	0
Sex of partner missing			20	3
Final N	1378	1014	3486	1440

Table 3.4 Number of events in the samples

	Austria		Belgium		Western Germany		Eastern Germany	
	Marital	Non-marital	Marital	Non-marital	Marital	Non-marital	Marital	Non-marital
First births to people in co-residential union at first interview[a]	600	605	541	403	2,050	840	483	891
Number of first births in final sample (after selection procedure)	584	379	496	269	1,886	492	421	596
Births in final sample in % of total number of first births	97%	63%	92%	67%	92%	59%	87%	67%

[a] The data includes respondents born 1971-1973 or 1981-1983 for Germany, 1970-1983 for Austria and Belgium.

Multivariate results

Table 3.5 Relative risk ratios of not having a first child compared to a marital first child

VARIABLES	Austria	Belgium	Western Germany	Eastern Germany
Time since union formation	0.98***	0.94***	0.98***	0.97***
	(3.4e-03)	(0.01)	(2.0e-03)	(4.4e-03)
Time since union formation^2	1.00**	1.00***	1.00***	1.00***
	(2.55e-05)	(5.24e-05)	(1.66e-05)	(3.38e-05)
Woman's age at union	0.71***	0.60***	0.81***	0.69***
	(0.06)	(0.09)	(0.04)	(0.08)
Woman's age at union^2	1.01***	1.01***	1.00***	1.01***
	(2.0e-03)	(3.3e-03)	(1.0e-03)	(2.5e-03)
Male (ref. Female)	1.01	0.99	1.03	1.02
	(0.1)	(0.1)	(0.05)	(0.11)
Union's cohort (ref. 2000-2004)				
1986-1994	0.59***	0.58***	0.75***	0.52***
	(0.1)	(0.1)	(0.05)	(0.08)
1995-1999	0.77**	0.82*	0.89*	0.80
	(0.1)	(0.1)	(0.0549)	(0.11)
2005-2010	1.24	1.35	1.76***	1.31
	(0.23)	(0.28)	(0.15)	(0.24)
Educational Assortative Mating (ref. Man medium & Woman medium)				
Man low & Woman low	0.19***	0.56***	0.48***	1.52
	(0.04)	(0.11)	(0.05)	(1.54)
Man low & Woman medium	0.39***	0.82	0.68***	0.64
	(0.09)	(0.19)	(0.08)	(0.24)
Man medium & Woman low	0.57***	0.78	0.60***	0.53**
	(0.09)	(0.19)	(0.1)	(0.16)
Man medium-low & Woman high	1.77***	1.33*	1.35***	0.90
	(0.32)	(0.21)	(0.11)	(0.13)
Man high & Woman medium-low	1.05	1.40	0.93	0.54***
	(0.13)	(0.31)	(0.07)	(0.09)
Man high & Woman high	1.58***	1.14	1.23***	0.59***
	(0.23)	(0.16)	(0.08)	(0.08)
Missing		0.88	1.26	0.14**
		(0.31)	(0.35)	(0.12)
Union's order (ref. first union)				
Higher order union	1.80***	1.38***	1.15*	1.10
	(0.29)	(0.14)	(0.10)	(0.19)
Age difference (ref. homogamy or age difference < 2 years)				
Woman 2 or more years older	1.38*	0.90	1.35***	0.91
	(0.26)	(0.16)	(0.15)	(0.20)
Man 2-4 years older	0.80*	0.90	0.87**	1.01
	(0.1)	(0.11)	(0.05)	(0.12)
Man 5 or more years older	0.68***	0.64***	0.91	0.88
	(0.08)	(0.09)	(0.10)	(0.13)
Missing		2.02	1.78**	8.42**
		(1.20)	(0.49)	(8.53)
log (Constant)	10.70***	12.51***	7.81***	11.26***
	(1.02)	(1.93)	(0.58)	(1.47)

Note: robust standard errors in parentheses; significance levels: *** p<0.01, ** p<0.05, * p<0.1